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ABSTRACT

Although men and women work in jobs requiring approximately equal levels of education and in occupations with approximately equal prestige, working women earn only about 60% as much on the average as do working men. This disparity in income has important social consequences and is widely perceived as inequitable. One form of this type of discrimination exists when a firm's jobs are segregated by sex or ethnicity and workers in one group are paid less than workers in another for performing work that is not the same, but is of comparable worth. Achieving equity in wages for persons performing different work is fraught with complications. At present no job evaluation scheme useful in enforcement of an equal worth requirement is available. Job evaluation practitioners claim to have a sex-fair job evaluation method that has been in use for years, but their claims are unconvincing. A job evaluation procedure must be developed that includes more structured job analysis inventories to assess the characteristics of jobs. Research needs to be done on the characteristics of work viewed as valuable and on the organizational consequences of alternative approaches to job evaluation. Firms must be assisted in developing more equitable compensation schemes. The practice of job evaluation in the future should generate technical manuals of the kind expected in the practice of psychological testing to allow the users to assess the theory, reliability, validity, and limitations of alternative approaches to job evaluation. (PAS)

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On the Equivalent Value of Different Kinds of Work

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On the Equivalent Value of Different Kinds of Work

Sex segregation in the American labor force is extensive. Women are disproportionately employed in occupations such as nurse, teacher, and social worker; and men are disproportionately employed in occupations such as carpenter, plumber, or manager (Gottfredson & Daiger, 1977). Furthermore, young men and women have traditionally and still do aspire to different kinds of work (Gottfredson, Holland, & Gottfredson, 1975; L. Gottfredson, 1982). Although men and women work in jobs requiring approximately equal levels of education and in occupations with approximately equal prestige (Gottfredson & Daiger, 1977; Treiman & Terrell, 1975), working women earn only about 60% as much on average as do working men (U.S. Bureau of the Census, 1980, Table 57). This disparity in income has important social consequences and is widely perceived as inequitable.

A National Research Council (NRC) Committee (Treiman & Hartmann, 1981) has recently examined the sources of wage disparities between men and women and concluded that for a variety of historical and contemporary reasons, part of the disparity is discriminatory.

Once upon a time employers and policy makers felt freer than they do today to behave in an overtly discriminatory way. Corporations reduced the pay rates for women produc-

tion workers 18 to 33 percent below those for men in the 1940's despite similar job evaluation scores (Newman, 1976). Once upon a time employers were not circumspect in verbalizing their preferences for employing women in certain jobs and men in others. The account of desirable characteristics collected from employers in Hartford and New Haven during the Great Depression and summarized by Noland and Bakke (1949) is instructive, and even shocking by today's standards.

These historical practices and the traditional institutional arrangements in the American labor market operate to prevent unhindered competition among workers and among firms (Treiman & Hartmann, 1981, Chap. 3) and probably create a residue of institutional inequity: sex discrimination in wages that is difficult to unequivocally demonstrate in any given instance, but which is unarguably present.

Varieties of Discrimination

The Committee cited three kinds of discrimination:
(a) Discrimination exists when one class of people is denied access to higher-paying jobs solely or partly on the basis of sex or minority status. This kind of discrimination is illegal under Title VII of the 1964 Civil Rights Act.
(b) Discrimination exists when one sex or ethnic group is paid less than another group working side by side, doing indistinguishable jobs, and producing similar results. This

kind of discrimination is illegal under the Equal Pay Act and other legislation of the 1960's. (c) Discrimination exists when a firm's jobs are segregated by sex or ethnicity and workers in one group are paid less than workers in another for performing work that is not the same, but that is of comparable worth. Achieving consensus on the meaning of "comparable worth" is difficult, and the legality of this form of discrimination remains unclear.

The third kind of discrimination, unequal pay for work that is in some sense of equal value, is the topic of my remarks today.

Multidisciplinary Evidence of Discrimination

The equity of pay rates is a practical concern that spans several disciplines, each of which has characteristic conventions for seeking knowledge and which share only to a modest degree each other's languages. The language of litigation and the language of science, as most of you know, often fail to mesh. When the NRC Committee concluded that the available evidence strongly suggests that wage discrimination is widespread it was relying on evidence of many sorts that converged in implying that a substantial portion of the wage gap between men and women is due to occupational sex segregation, and to historic influences and institutional arrangements that prevent wages from being determined by the unrestrained operation of the labor market. Evidence

of several types converge in strongly implying that wage inequity is widespread. The historical openly expressed views about the propriety of differential wage rates for men and women is one piece of evidence. Other evidence comes from past compensation practices.

In the 1930's Westinghouse had created a job evaluation system for its plants. At one plant, female jobs were assigned grades 1 through 5, and male jobs with the same evaluation scores were assigned to parallel grades--1 through 5. Five additional grades were created for male jobs with higher scores. Altogether there were 10 grades for male jobs (1 through 10) and five for women (1 through 5), and the first 5 grades were "equivalent" in terms of their evaluation scores. Wage rates were not parallel. All of the female grades were paid less than the lowest male grade. In 1965 these separate male and female series were merged into a single series. Male grades 1 through 10 were relabeled 6 through 15, preserving the sex differential in pay. This merger of the two series did not reflect the original evaluation of these jobs. It appears unlikely that past practices are not reflected to some extent in current wage rates in our economy.

Another kind of evidence comes from the work of compensation consultants who examine the compensation practices of organizations as part of their work. One relatively well

known illustration is the examination by Willis (Note 1, Note 2) of compensation in the Washington State government. Using a job evaluation scheme similar to the proprietary Hay system (see Treiman, 1979), Willis and Associates demonstrated that jobs held mostly by women were paid less than jobs of comparable value according to the job evaluation but held mostly by men. A less well known illustration comes from the application of the Position Analysis Questionnaire (Mecham, McCormick, & Jeanneret, Note 3, Note 4), a structured job analysis inventory. In an unpublished investigation by P.R. Jeanneret (cited by McCormick, 1981, as a personal communication) wages were regressed on job characteristics measured using the job analysis inventory and the residuals observed. According to McCormick (citing Jeanneret) when the average actual pay of men and women in each pay grade resulting from the regression exercise was compared with the pay implied by the evaluation scheme, "a salary difference of $108 a month in favor of men" was found. Another example is provided by Roose & Doherty (1978).

The Preponderance of Evidence

No single kind of evidence--not the historical evidence, not the evidence from case studies, not the evidence from sociological or economic models of income attainment, not the studies of institutional barriers to the unfettered

working of the labor market--is persuasive.1 Indeed it is fair to say not only that the specific studies, but also that the various disciplinary approaches to the study of pay, are flawed. Taken together, however, the evidence implies that discrimination in the wages of males and females exists in our economy. A practical consequence of this interpretation is that market wage rates may incorporate discriminatory elements. This implies (and this is an issue that creates a great deal of consternation) that a compensation scheme keyed to market wage rates may build in discriminatory elements of existing wage structures.

Promoting Equity in Wages

Achieving equity in wages for persons performing different work is fraught with complications. It is widely assumed that one purpose of the Equal Employment Opportunity Commission (EEOC) in requesting the NRC study of comparable worth was to begin a "search for an enforcement mechanism" (McGuiness, 1980, p. vi). If it should turn out that the courts or clearer new legislation should make enforcement in

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1. The temptation to draw stronger conclusions than the evidence warrants is often overwhelming. For example, the work by Jeanneret does not conclusively demonstrate discrimination in past wage practices because the instrument used may not measure all compensable factors explicitly and implictly used in the construction of previous wage rates, and it does not measure job characteristcs in an error free way. Nor does that study demonstrate that this type of structured job analysis questionnaire can "fairly evaluate jobs without regard to the sex of the incumbents" (Jeanneret, quoted by McCormick from personal communication, 1981).

this area appropriate, guidance in developing enforcement methods will clearly be needed. Concerns with equity are, however, not solely enforcement issues. The widespread use of job evaluation in large organizations is an indicator of the value of rational methods of setting wages in an ambiguous environment.

The utility of a method or procedure is related to its complexity. Complex, costly, and obtuse procedures are burdensome and unlikely to be used willingly. At present, it appears that no job evaluation scheme useful in enforcement of an equal worth requirement is available. The task of detecting bias in an explicit manner is beyond our grasp in all but the grossest instances of bias. (Gunther may be an illustration of such a gross instance.) No method for enforcement exists for many reasons, not the least of which is expressed by the NRC Committee's conclusion that "No universal standard of job worth exists. . . ." (Treiman & Hartmann, 1981, 94). Measurement problems--which I will describe shortly--aggravate this problem.

Multiple Uses of Job Evaluation

Compensation schemes in general, and job evaluation mechanisms in particular, have multiple uses in organizations. Many of these are essentially ignored in the NRC Committee report, and this oversight is a major weakness in the report. Compensation serves valuable functions in

(a) recruitment, (b) retention of workers, (c) employee motivation, and (d) "filling in the gaps" when there is otherwise no clear way to determine what a wage rate should be. Often an organization needs an understandable and defensible method to determine wage rates under conditions of ambiguity.. This may be especially true of organizations that promote from within (or in the jargon of the economist, rely on "internal labor markets"), or include specialized jobs that do not exist in large numbers elsewhere in the local labor market. Job evaluations must be understood by, and often agreed to by, union negotiators, workers, and managers. Many uses of job evaluation appear to serve these practical needs. When viewed as a vehicle to enforce wage equity, job evaluation methods as currently developed and practiced are about as appropriate as a canoe on the Santa Monica Freeway.

The potential to use job evaluation to promote pay equity is clear. Its potential in designing pay structures to create equity is especially clear. Its potential in detecting inequity post hoc is less clear.

Psychometric Limitations of Job Evaluation in Enforcement

One hotly debated issue within the NRC Committee was whether or not (and how) to present approaches to remediation. The result of this dissatisfying debate was the presentation of a selection of obviously imperfect approaches as a place to start. The suggestions for a place to start

mostly involve one or another sort of "model" of wages. Achilles only had two heels; job evaluation has at least four:

- Comprehensiveness and selection of compensable factors.
- Measurement of compensable factors.
- The existence of common compensable factors in different segments of a firm or common compensable factors for different jobs.
- The degree of sophistication among practitioners and consumers of job evaluations.

Comprehensiveness and selection of compensable factors. We do not now know enough about the actual characteristics of jobs that are (or "ought" to be) compensable to make the selection of such factors judgment free. A likely consequence of any externally generated or *a priori* list of compensable factors is the exclusion of some defensible compensable factors. The problem of selection and completeness for an organization attempting to *use* job evaluation to achieve equity is reasonably clear in principle. Compensable factors should reflect what the organization in its best judgment deems worthy of compensation. Compensable factors should be "honest," that is they should not be selected to serve as proxies for the social characteristics of the job incumbents. Applying this principle will undoubtedly be harder than stating it. Because there is no broad agreement

in our society on appropriate compensable factors, the specification of such factors in a way that is applicable everywhere is currently not possible.

The state of the art in the measurement of compensable factors is crude. Large issues of construct validity go unexplored, and the reliability of existing methods is imperfect. For an unsympathetic account, see Treiman (1979), a paper produced by the NRC Committee's staff. Schwab (1980) points out that the task of specifying and measuring compensable factors is a difficult problem of establishing construct validity in the absence of clear criteria to predict.

A fabricated example of the measurement problem. A method suggested as a promising approach to detecting pay equity in the NRC Committee's report involves a regression model of wages. According to this model, one would estimate the following equation:

$$\hat{W} = \sum_i b_i F_i + b_k S + c \qquad (1)$$

In this equation $\hat{W}$ equals predicted wage, the F_i are the compensable factors, and S is sex. The b's are metric regression coefficients. To show how imperfect measures can

lead to misleading conclusions I have created the model and artificial data shown in Figure 1. Let's see what happens when this model is estimated for the fabricated data. Table 1 in your handout shows the true correlations among the variables in the Figure 1 model. These correlations, together with the (fabricated) measurement parameters shown in Figure 1, were used to compute the results shown in the other Tables. The "observed" correlations calculated from the true model are shown in Table 2. Using these "observed," i.e., fallible data, and assuming unit variance and zero means, I calculated the (standardized) parameter estimates according to the regression model of equation 1. The results are shown under the heading "fallible data" in Table 3. Note how the regression results with fallible data create the misleading impression that the X_5 (i.e., pay) is determined in part by X_3 (i.e., percent male). The data were fabricated to represent a case where this impression is false. In this case, the non-zero beta for X_3 is entirely the result of (a) a correlation between the true score for variable 3 and variable 2 (which is a determinant of T_5 (or pay), and (b) the contamination of the variable intended to stand as a proxy for T_4 with undesirable variance in T_3. As a practical matter, attempts to use a regression approach to modeling pay to detect bias in pay will involve fallible data, and misinterpretations are therefore difficult to guard against. Attempts to estimate more complex measure-

ment and structural models will involve judgment in the specification of models, and there is no clear way to know when a model is correctly specified. Deciding on the correct specification of a model will be especially difficult if the specification of the model is what is under dispute in litigation.

In designing a compensation scheme, designers will want to avoid any association of sex composition of jobs with pay once explicitly stated compensable factors are taken into account. This is a relatively straightforward matter posing few technical difficulties. It is the interpretation of a residual association of sex with wages in the context of a post-hoc model of wages that is fraught with difficulties. Contrary to the apparent opinion of the majority of the NRC Committee (Treiman & Hartmann, 1981, p.85) attributing residual association of sex with wages to discrimination is a poor practice.[2]

Are compensable factors common across all jobs in a firm? An issue on which the members of the NRC Committee were sorely divided is that of the appropriateness of the use of the same set of compensable factors for different groups of jobs within the firm--for shop and office jobs, for example. Some members took the position that if a factor is compensable, it ought to be so regarded for all jobs in the firm.

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2. I was outvoted on this point, among others.

Another group viewed the appropriateness of a single set of compensable factors within a firm as an unsolved practical and theoretical problem. We argued that there may be cases when a single set of compensable factors can be specified, and that their importance may be equal in all units and kinds of work in a firm. On the other hand it is possible that different compensable factors may characterize work in one unit or kind of work in a firm and not in another. If this were so, rigid adherence to a single set of compensable factors to be applied throughout the firm would not provide a construct-valid assessment of worth. A great deal of additional work will be required before any firm basis to make even a judgment call in this area will be possible. Guion's (Note 5) work currently under way is one start on the examination of this problem, but will certainly not solve it.

Simple solutions to complex problems. The use of job evaluation to promote equity is an innovation. The principal uses of job evaluation in the past have not been part of an effort to reduce wage disparities between social groups. We know from experience with regulatory agencies that they are prone to seek simple, head-on templates against which to judge compliance. Alas, the current undeveloped state of the art in job evaluation for the purposes of promoting equity implies that the issues in determining whether pay rates are equitable will be complex. Few agency personnel,

few judges, and few social scientists have a sufficient grasp of measurement and statistics to sensibly interpret technical discussions without relying on the opinions of "experts." Furthermore, many of the so-called "experts" themselves appear unsophisticated in this area. I was amazed by letters the Committee received from job evaluation practitioners informing us that they had a sex-fair job evaluation method, and had been using it for years. These claims were unconvincing, and show poor professional judgment. At the present time it remains unclear just what "fair" means.

So What Do We Do?

The members of this Division have a special role to play in educating business and industry, public sector employers, Federal agency personnel, and the legal community in approaches to pay equity. Among the members of this Division, we have the expertise, access, and responsibility to develop job evaluation for a relatively new use. It is too early to develop "standards" for job evaluation or even to be able to state in clearly articulated form what sound professional practice in this area should be.

But we can accelerate our work in this area. We need several kinds of work. We need better and more comprehensive structured job analysis inventories to assess the characteristics of jobs. The available inventories appear best

suited for production jobs and are weak in their assessment of managerial, scientific, literary, and professional jobs. Task analysis inventories are especially narrow in scope. How can we measure all jobs in a complex firm using a single instrument?

We need research on the characteristics of work viewed as valuable. How do employers, women's groups, skilled crafts workers, psychologists, and judges make judgments of value? Are judgments of value independent of the context within which they are made? How can information about the productivity of alternative work activities be merged with judgments of the work itself to more realistically reflect issues of profitability in job evaluations?

We need research on the organizational consequences of alternative approaches to job evaluation. How far can an internal job evaluation scheme deviate from prevailing wage rates for jobs for which there is an external market without causing problems for recruitment and retention of workers? What are the consequences of evaluation schemes that tie wages to job characteristics for the productivity and profitability of the firm? For worker morale or job satisfaction? For career development?

Let's Get Some Practice

We can increase the extent to which we assist firms in developing more equitable compensation schemes. Practical experience in assisting organizations to accomplish this objective--together with their other objectives--will lead to a cummulative knowledge of job evaluation and pay equity. The results of our work should, to the extent possible, be public. Some job evaluation schemes are difficult to assess because information about them is difficult to obtain. This kind of closed practice should not be regarded as appropriate professional behavior. Although the welfare and rights of clients must be protected, the secrets of psychologists need not be. The practice of job evaluation should generate technical manuals of the kind expected in the practice of psychological testing. These manuals will allow users and other psychologists to assess the theory, reliability, validity, and limitations of alternative approaches to job evaluation.

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Table 1

Correlations Among the Hypothetical Constructs in the Figure 1 Model

	T_1	T_2	T_3	T_4	T_5
T_1	1.0000	.0000	.0000	.0000	.5000
T_2	.0000	1.0000	.4000	.0000	.7071
T_3	.0000	.4000	1.0000	.0000	.2828
T_4	.0000	.0000	.0000	1.0000	.3000
T_5	.5000	.7071	.2828	.3000	1.0000

Note. -- These correlations were fabricated. Results in Tables 2 and 3 are based on these artificial data combined with the (also fabricated) measurement model parameters shown in Figure 1.

Table 2

Implied Correlations Among the "Observed" Variables

	X_1	X_2	X_3	X_4	X_5
X_1	1.0000	.0000	.0000	.0000	.3500
X_2	.0000	1.0000	.1980	.0800	.3536
X_3	.0000	.1980	1.0000	.3960	.2800
X_4	.0000	.0800	.3960	1.0000	.3231
X_5	.3500	.3536	.2800	.3231	1.0000

Table 3

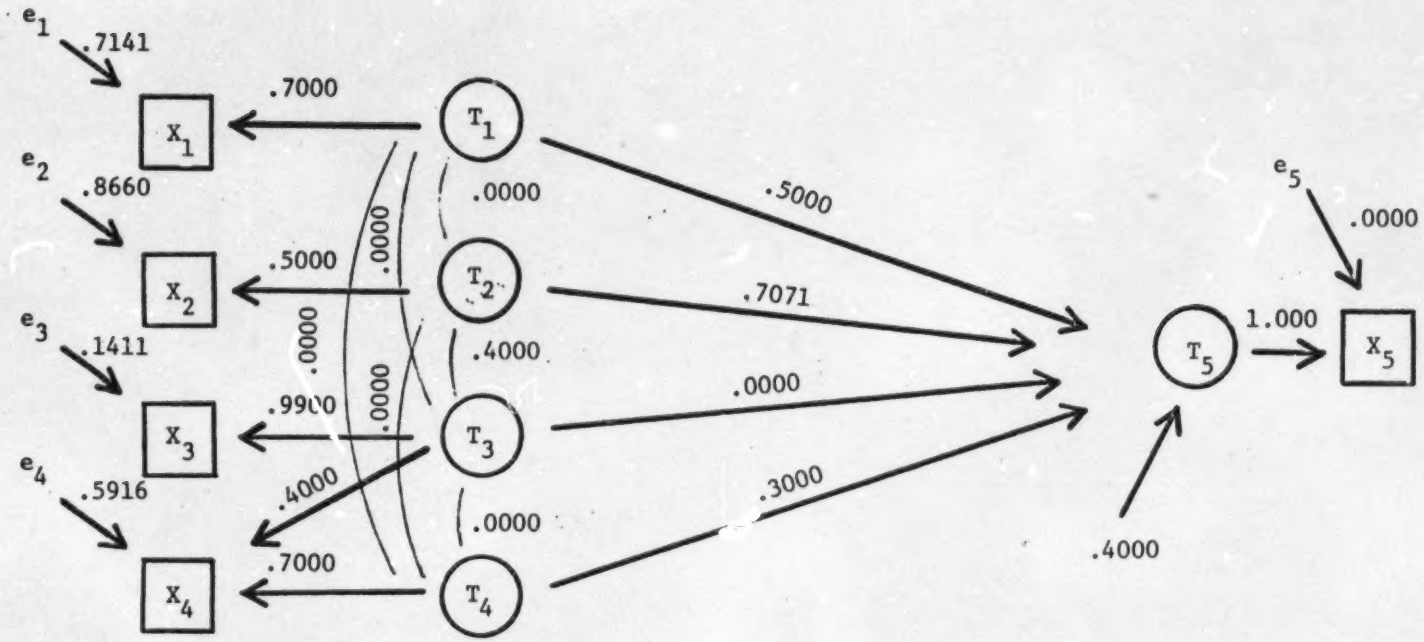
Zero-Order Correlations and Regression Coefficients for Fallible Data Compared to the True Model for the Determination of T_5

Predictor	True model		Fallible data	
	r	beta	r	beta
X_1 ("skill")	.5000	.5000	.3500	.3500
X_2 ("effort")	.7071	.7071	.3536	.3099
X_3 (pct. male)	.2828	.0000	.2800	.1192
X_4 ("responsibility")	.3000	.3000	.3231	.2511
(R^2)	(.8399)		(.3466)	

Note how the regression results with fallible data create the misleading impression that the outcome variable (number 5) is determined in part by variable 3. The data were fabricated to represent a case where such an impression is false. In this case, the non-zero beta for X_3 is entirely the result of (a) a correlation between the true score for variable 3 and variable 2 (which is a determinant ot T_5), and (b) the contamination of the variable intended to stand as a proxy for T_4 with undesirable variance in T_3.

Figure 1

A Fabricated Model for the Determination of T_5 Constructed So That by Definition T_3 Does Not Influence T_5



Note. -- Circles represent hypothetical causal variables. For example T_1, T_2, and T_4 may be "skill," "effort," and "responsibility," respectively. T_3 might be sex. Boxes represent observed variables which are measured with error and, in the case of X_4 are contaminated with a measure of an inappropriate construct as well. Errors in the left-hand set are uncorrelated.